Tubastraea coccinea in Florida

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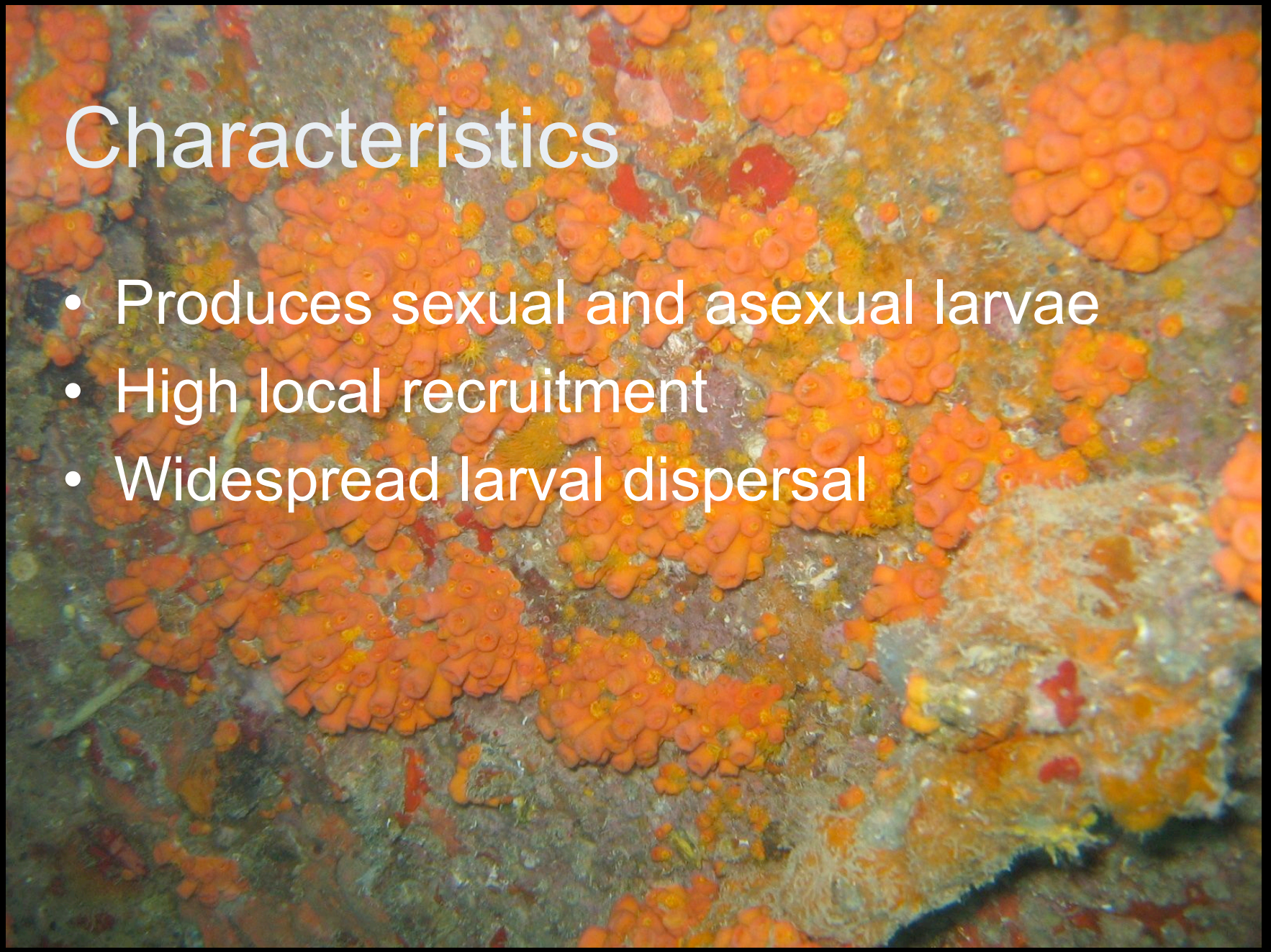
Orange cup coral *Tubastraea coccinea*

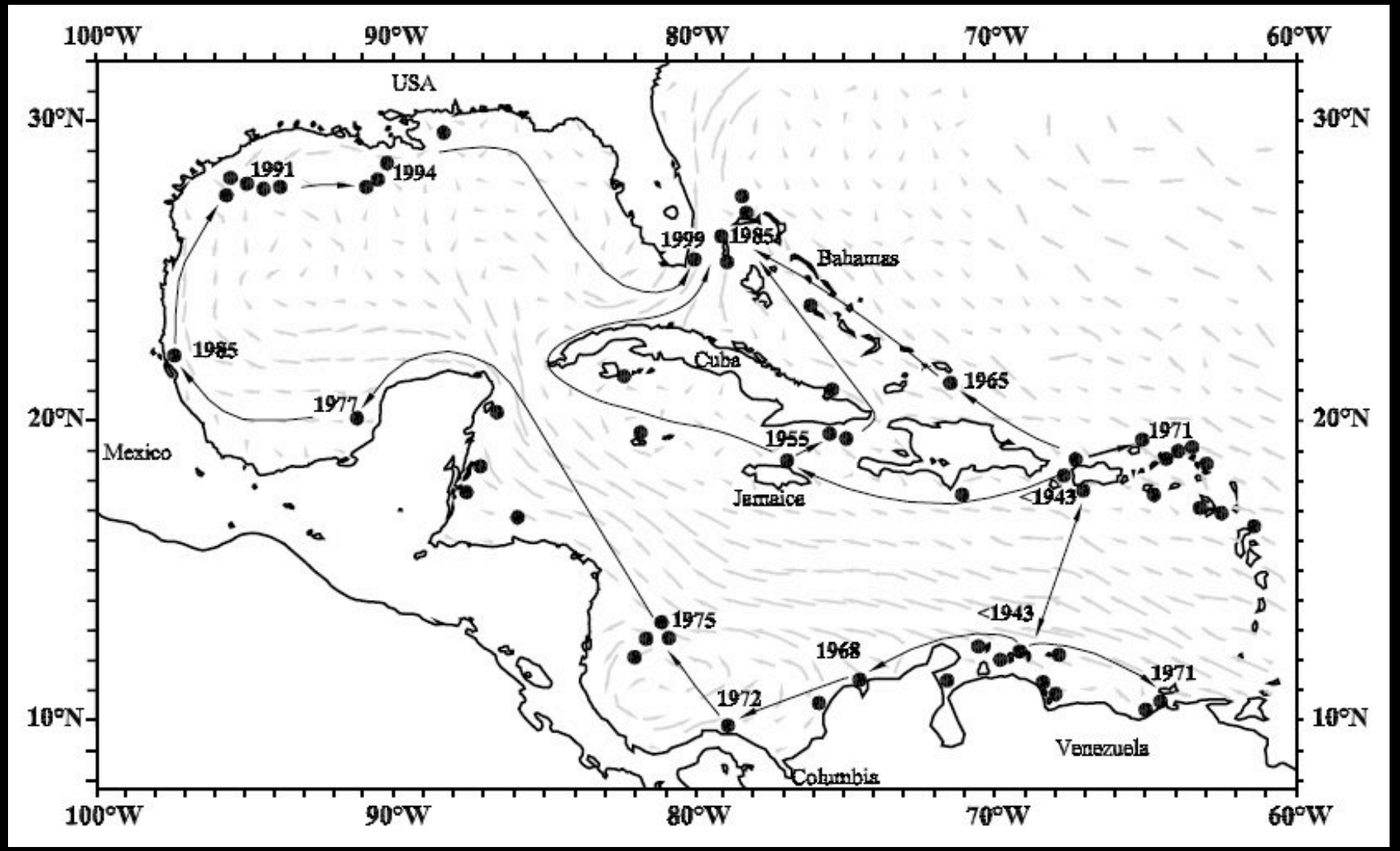
- Indo-Pacific azooxanthellate scleractinian species
- Introduced into the Caribbean in early 1900s**



Characteristics

- Produces sexual and asexual larvae
- High local recruitment
- Widespread larval dispersal

Distribution (Fenner & Banks 2004)



Competitive capabilities

- Highly prolific
- Reproduces at small colony size (2 polyps)
- Allelopathic chemicals toxic to coral tissue and larvae
- No natural predators in Caribbean

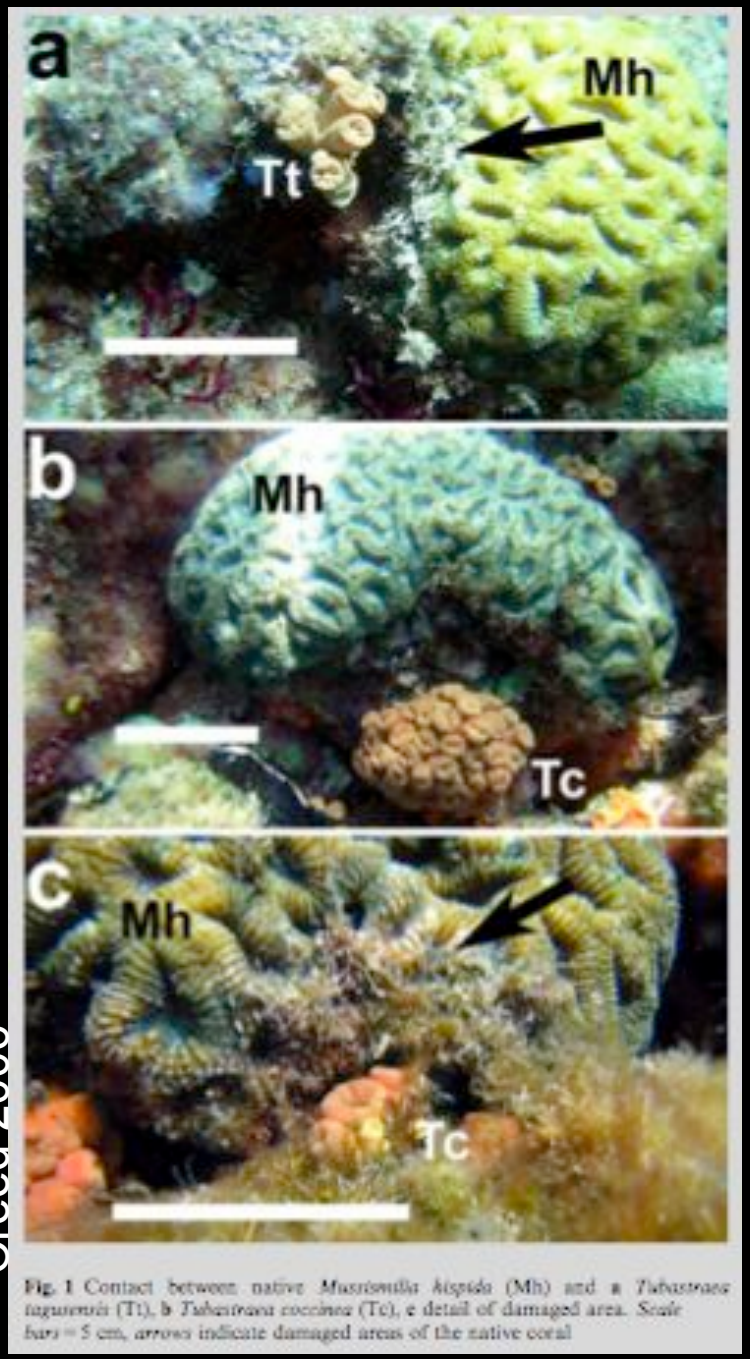


Fig. 1 Contact between native *Mussismilia hispida* (Mh) and a *Tubastraea tagusensis* (Tt), b *Tubastraea coccinea* (Tc), c detail of damaged area. *Scale bars* = 5 cm, *arrows* indicate damaged areas of the native coral

Creed 2006

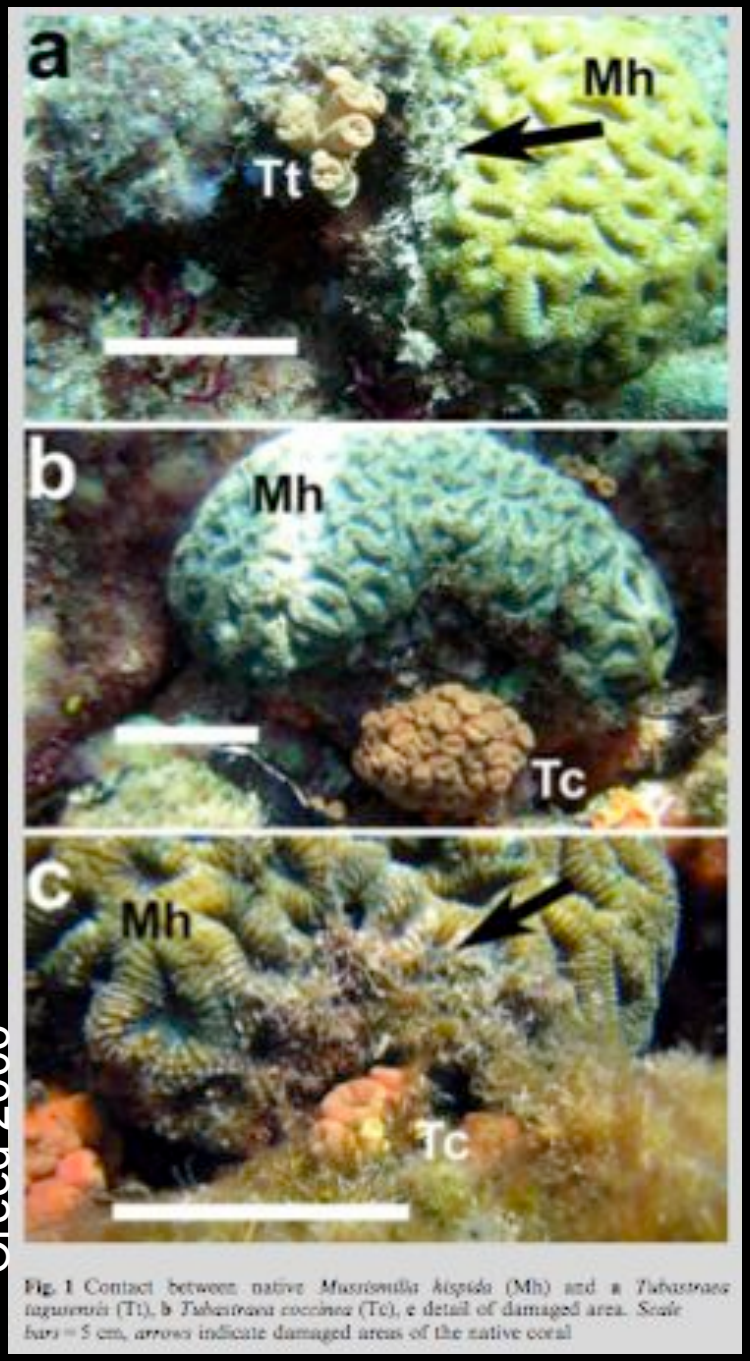
Competitive interactions

Tissue necrosis and partial mortality in native Brazilian corals

Extract kills larvae of other coral species

Local efforts to remove orange cup coral in Brazil and FGBNMS

Competitive interactions



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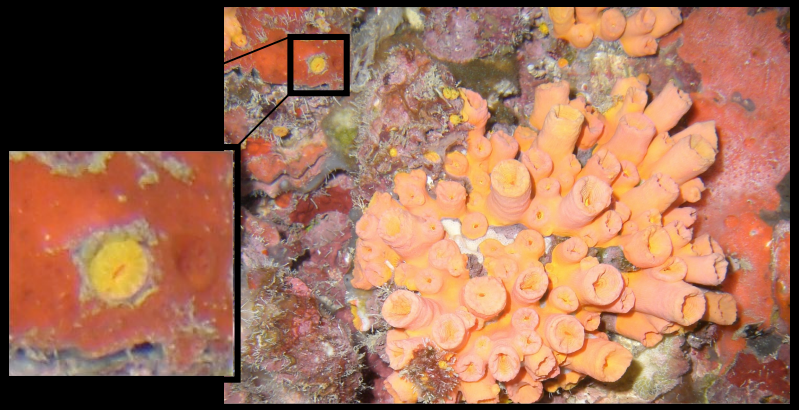
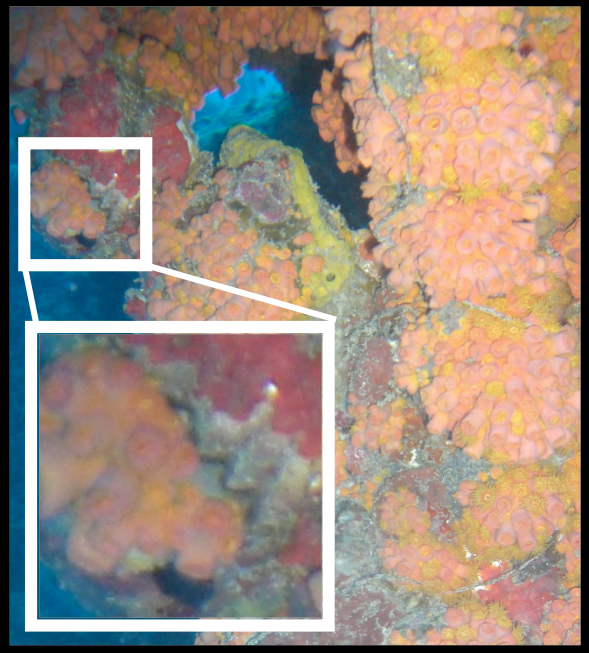




Impacts on bivalves

- VIDEO

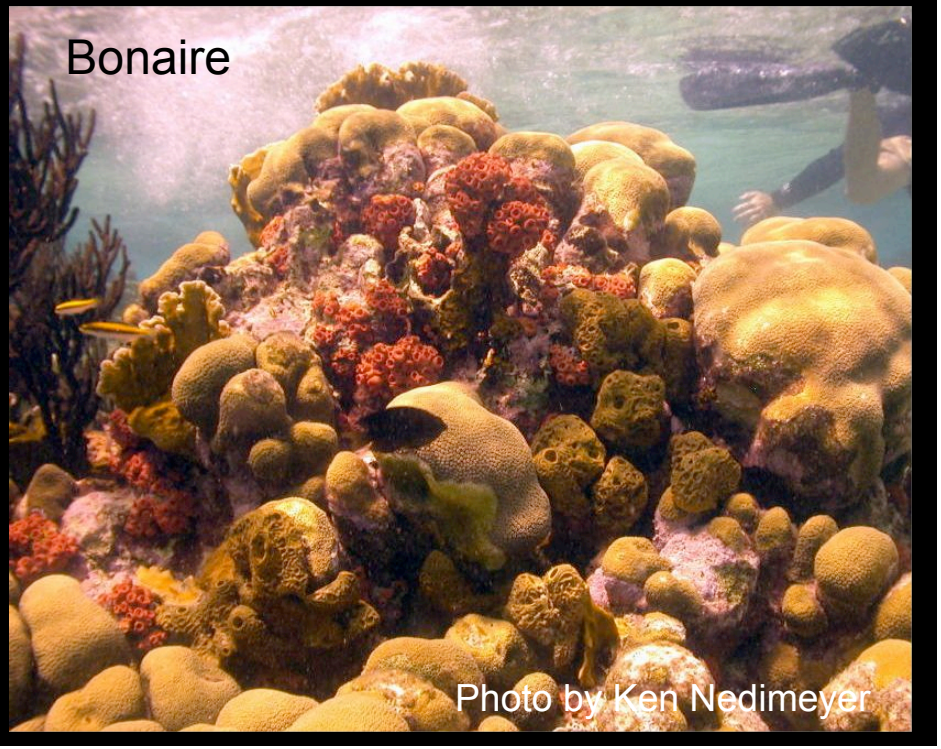
Tubastraea on bivalve shells

Ancient Mariner wreck (FL) April 2010

Benthic photo by K Mille, Florida Fish & Wildlife Conservation Commission

Characteristics have led to widespread distribution…

- Deep and shallow habitats
- Artificial and natural substrates



as well as large population sizes

USCG Duane
Key Largo, FL
2008

Photo from www.divertom.net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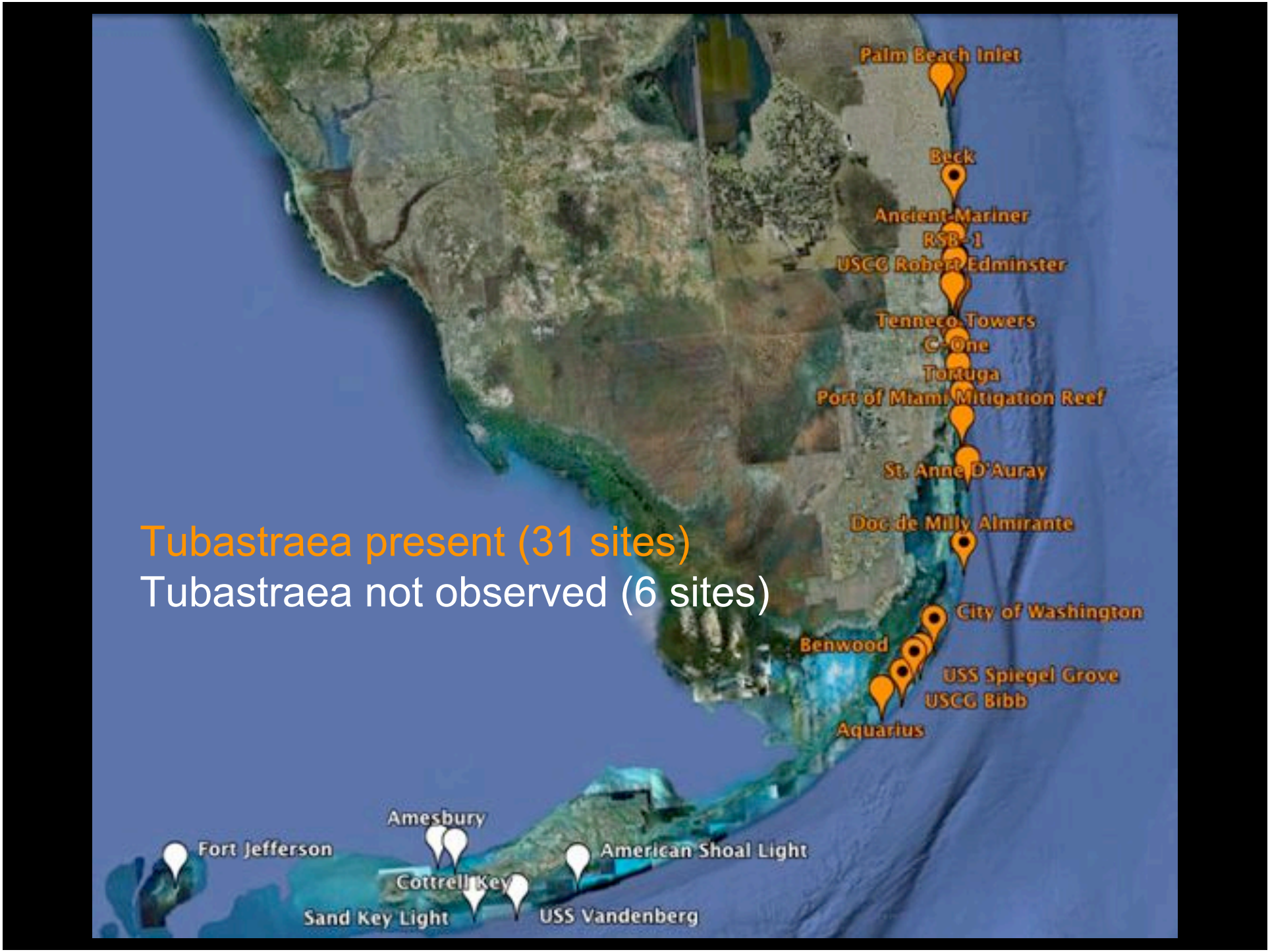
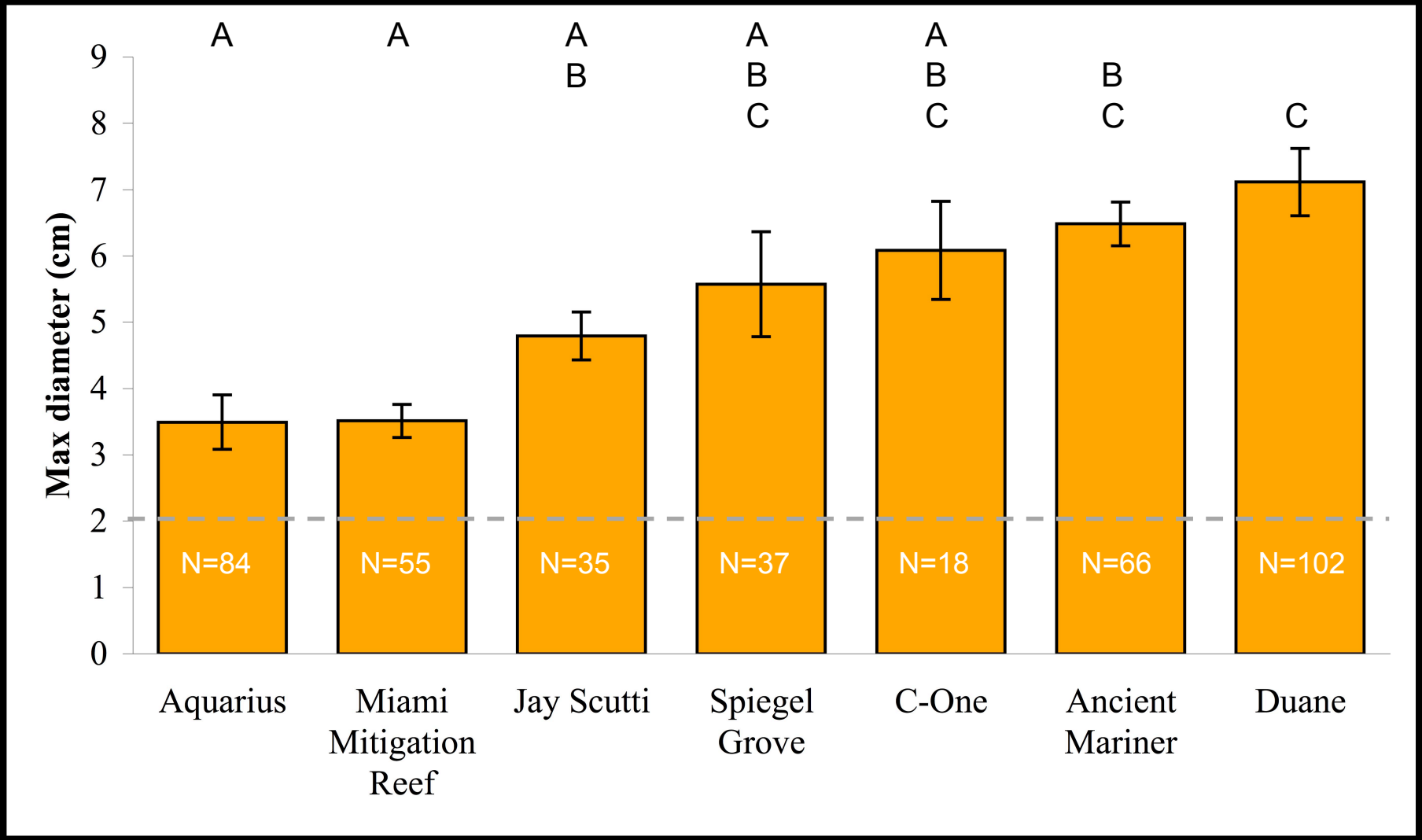
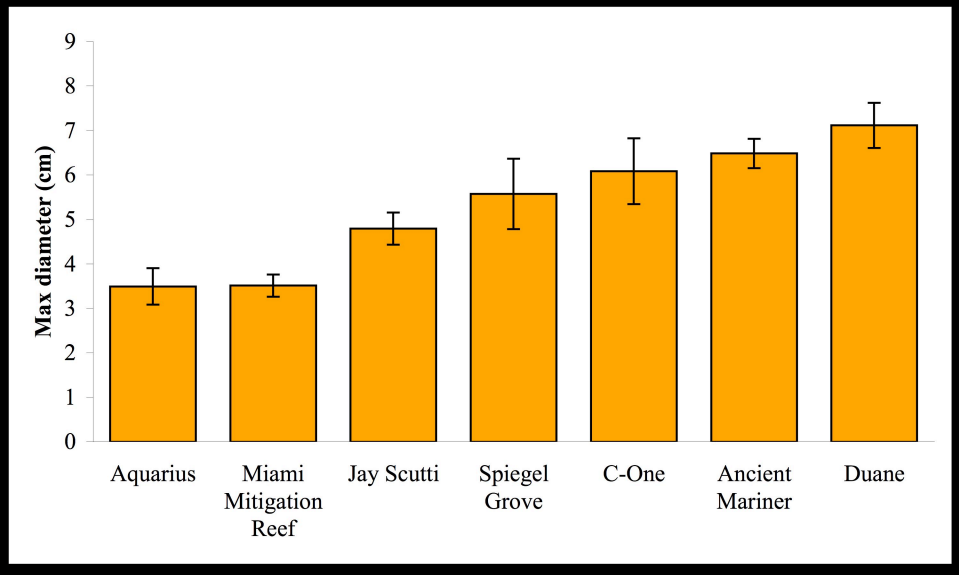

Palm Beach Inlet
Beck
Ancient Mariner
RSB-1
USCG Robert Edminster
Tenneco Towers
C-One
Tortuga
Port of Miami Mitigation Reef
St. Anne D'Auray
Doc de Milly Almirante
City of Washington
Benwood
USS Spiegel Grove
USCG Bibb
Aquarius
Tubastraea present (31 sites)
Tubastraea not observed (6 sites)
Amesbury
Fort Jefferson
American Shoal Light
Cottrell Key
Sand Key Light
USS Vandenberg

Size distribution

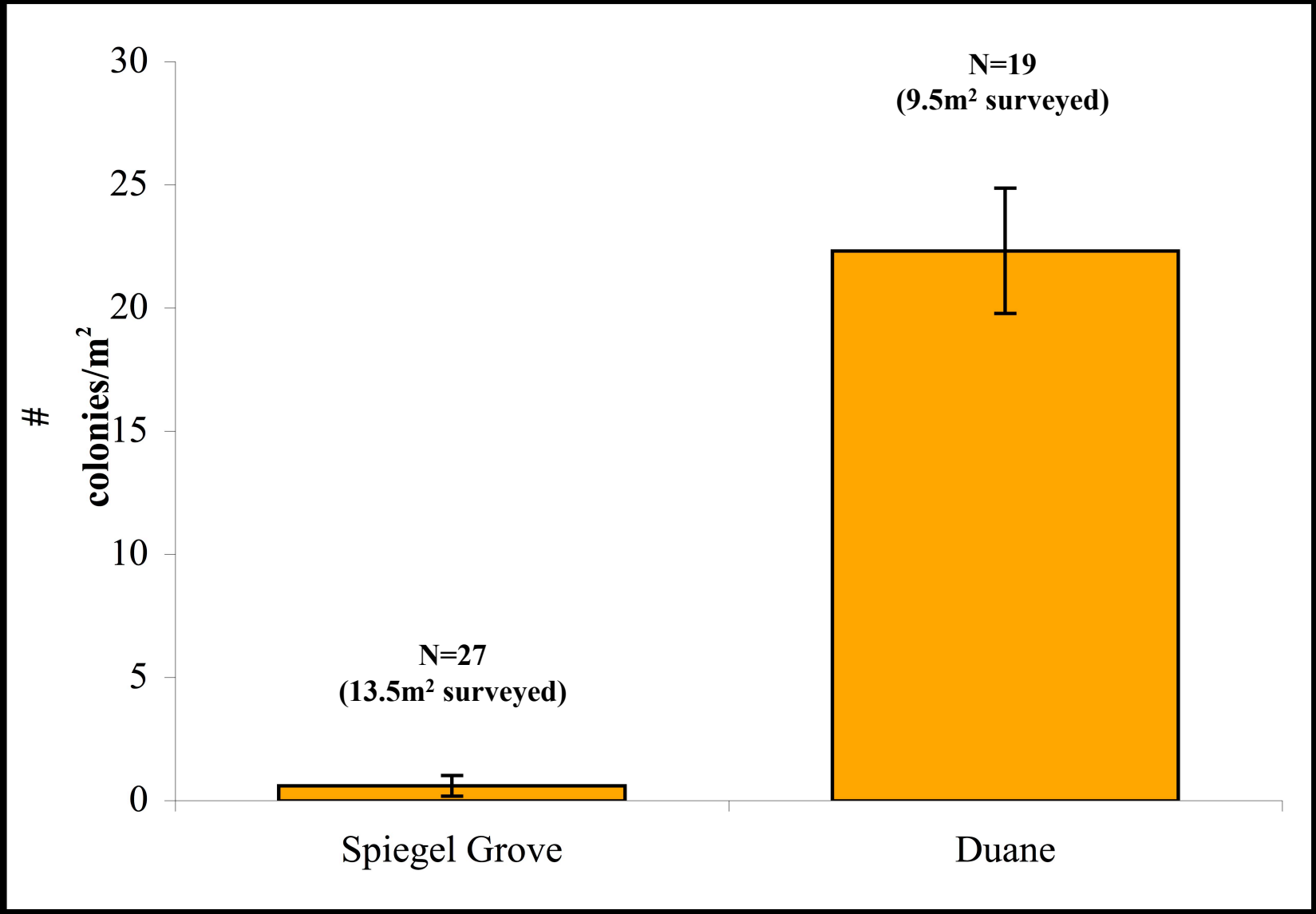


Size distribution

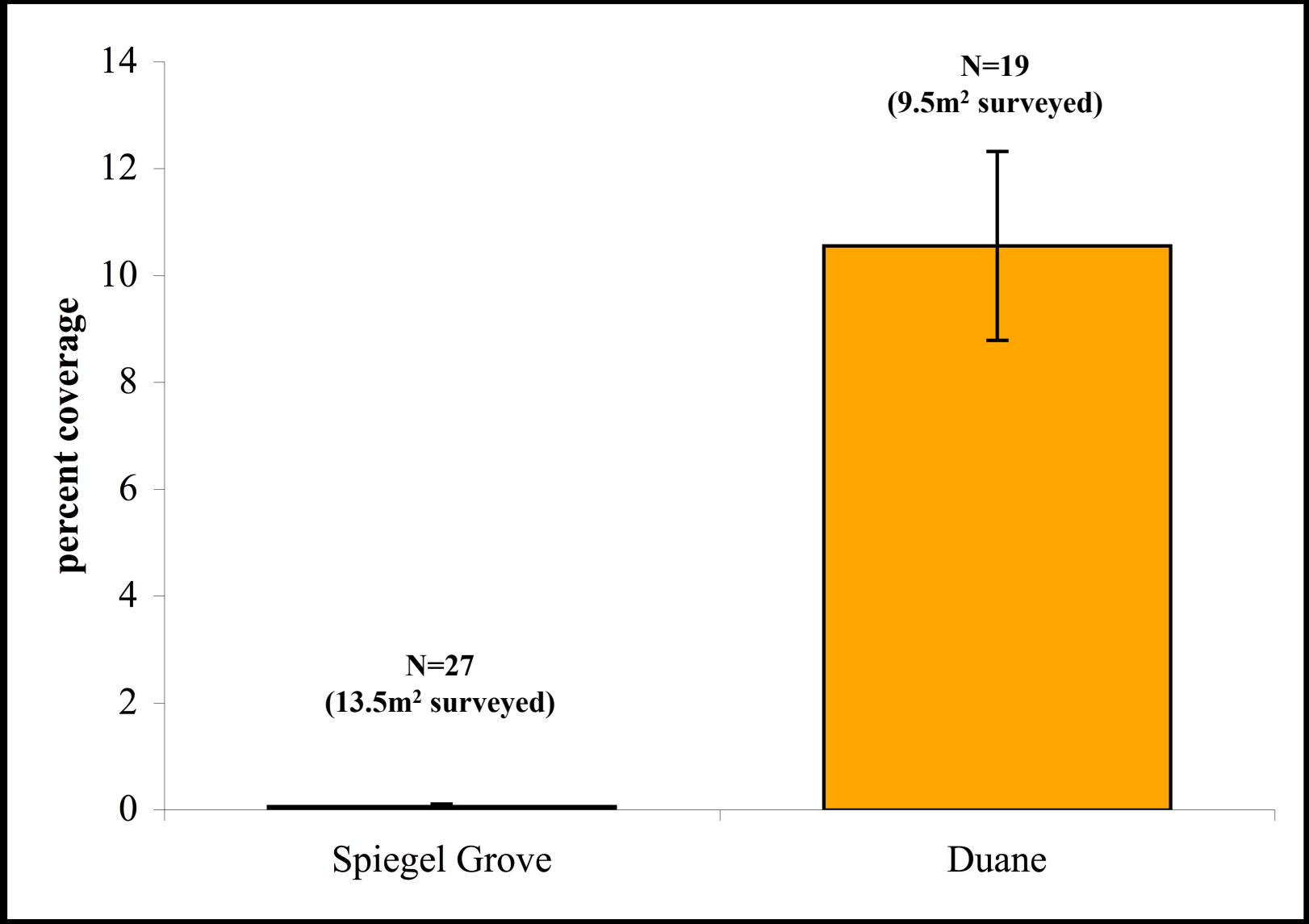
N=84 N=55 N=35 N=37 N=18 N=66 N=102



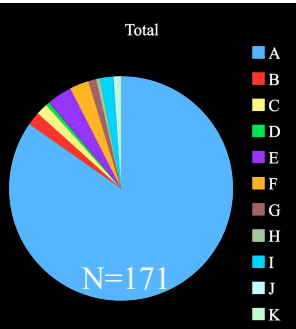
Density

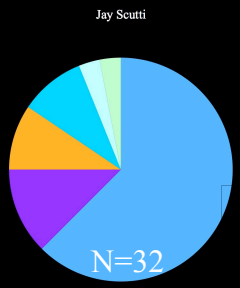

30
25
20
15
10
5
0
# colonies/m²
N=19
(9.5m² surveyed)
N=27
(13.5m² surveyed)
Spiegel Grove
Duane

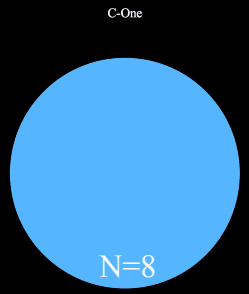
Coverage (<100' depth)

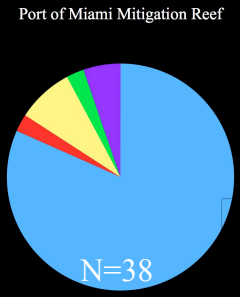


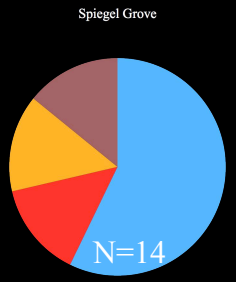
Genetic diversity

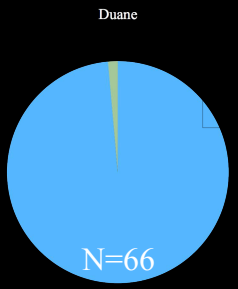










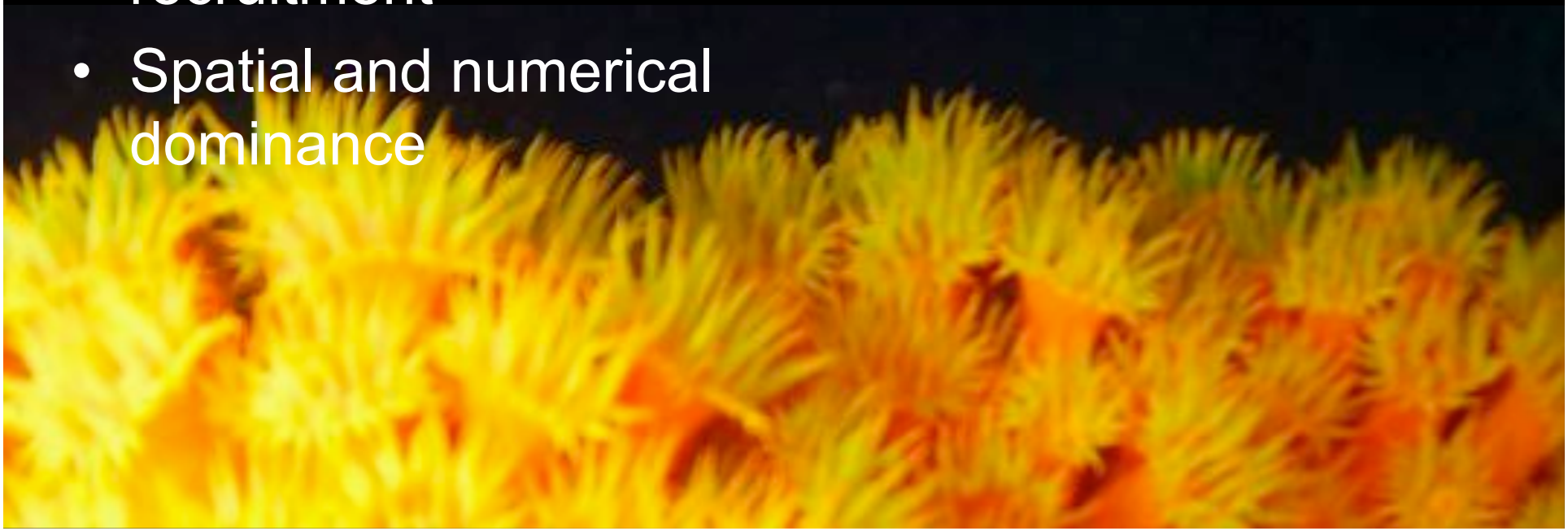


Summary

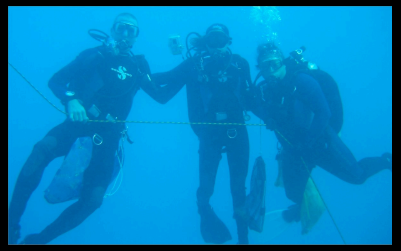
- *T. coccinea* is widely distributed on artificial structures in south Florida and the upper Keys
- Population sizes and geographic range has expanded
- Genetic diversity is low
- Certain clones may have higher rates of asexual reproductive success

Potential ecological impacts

- Decreased biodiversity
- Increased mortality of native species
- Reduced native coral recruitment
- Spatial and numerical dominance
- Coral disease implications
  - Pathogen sink
  - Pathogen spill-back



Acknowledgements



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GEORGIA AQUARIUM at Pemberton Place

ANAMAR Environmental Consulting, Inc.

Coral Reef Targeted Research & Capacity Building for Management

Thank you